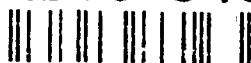


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THE INDUSTRIAL BASE: FACING EXTINCTION

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JUN 02 1992

BY

MR. DAVID L. THOMAS
Department of the Army Civilian

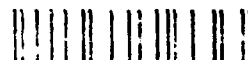
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The Industrial Base:

Facing Extinction

AN INDIVIDUAL STUDY PROJECT

by

David L. Thomas

Colonel Robert Ames

Project Advisor

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ABSTRACT

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The industrial base, that supports the military in the production and supply of everything from high-tech weapons to boots and bandages, includes both the private and public sectors. The portion that has always been privately owned and operated has remained so. Yet, many organic operations have shifted from government owned and operated to an increased dependence on the private sector. This cooperation has been responsible for developing some of the most advanced weapons in the entire world. In doing so, it has provided our men and women of the armed services the best equipment of any military force. Today, it may be on the brink of a great upheaval. Perhaps more accurately - a great downhill slide.

The heyday of the Reagan Administration, when the emphasis was on upgrading the equipment, weapons and everyday items used by our troops, has given way to a focus on the day-to-day problems of everyday America. Monies that before were used to support research, production, and maintenance of our military equipment is now being directed to drug interdiction, pollution, and health care. The Soviet Union has fallen apart and in many people's minds there is no threat to our nation, at least militarily speaking. However, lack of stability among the republics has the potential for greater dangers, and makes planning for contingencies even more difficult.

With this mind set, that no military threat exists today, little attention is being paid to the slow, yet apparent, demise of the industrial base that supports our military structure.

A Thought

Winning wars is wonderful, preventing them is even better, but to prevent wars it is first necessary to be able to fight them. The most effective armed forces are those that are so well-prepared to fight that potential opponents think long and hard before challenging them and then decide not to because of the costs and risks involved. ¹

Wallace J. Theis

Parameters, Spring 1991

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Introduction

Overview.

We are living in a time when "peace is breaking out all over." The emphasis of our country has shifted from a cold war defense to a social war against poverty, crime, hunger, sickness and pollution. Even this social war is hampered in its efforts as our nation and its people face a severe economic crisis. With high rates of unemployment and a general down turn in business there appears to be no short term solution. During this time, numerous announcements have been made on the restructuring and downsizing of the military forces to coincide with the peace most of the world now enjoys.

The United States, as a nation, was riding high on emotion and national pride after a quick and decisive gulf war early in 1991. Yet, the need for a prominent military structure is fast losing its appeal to the nation as the economic crunch worsens. The national desire to invest in programs to cure some of our social problems, instead of investing in and maintaining a military structure, gains more support with each passing day. Thoughts of taking care of ourselves first, sort of renewed isolationism, are heard continually in political speeches and are included in the words of legislation being introduced in Congress. In the minds of many, the military is fast becoming a dinosaur that has outlived its usefulness.

As the military forces are faced with cutbacks to almost

bare minimum capabilities, the support structure faces critical times in adjusting to a smaller and more efficient approach without disappearing altogether. The complexity of the industrial base, with its multitude of small independent vendors and manufacturers in the private sector and the diverse organic structure of the public sector, does not allow for a rapid change in makeup without the loss of some businesses and processes. This loss of capability should cause great concern. We must demand serious examination of the impact this loss of capability will have on the ability of our forces to respond to an extended military effort.

"The core of any program for maintaining a capability to reconstitute U.S. military forces will necessarily be a program to maintain in operation (or at least in existence) industrial capacity that otherwise would disappear." ² It is within this arena, where the military frequently depends upon the commercial sector to provide it with the needed goods and materials, that we must look at the ability of the industrial base to respond to military needs. "What is certain is that as the U.S. military budget and force structure shrinks, so will the defense industry that serves it." ³ Industries are starting to change production lines from armaments and defense supplies to consumer products that are more profitable in the private sector, both in the United States and in foreign markets. Unlike most things that have become extinct by over harvesting, the industrial base may become extinct by virtue of being ignored.

Determining the current structure of the industrial base, and reviewing alternatives for adapting that structure to future requirements, will be the focus of this paper. The first section deals with the challenges facing the industrial base as it attempts to adapt to changing political and social cultures. The follow-on section discusses ways and methods the government and industry can/should explore to preserve the crucial parts of our industrial base.

Background.

"Each time the United States entered a conflict, it was not totally prepared to provide the war material to support the American soldier on the battlefield, despite the fact that, beginning at the end of World War I, there was always a between-wars effort to prevent shortages in the future." ⁴

Conflicts in Granada, Panama, and most recently in the Persian Gulf, lend some credence to the short-war theory - that wars the United States will be involved in will be of short duration. This theory often makes the option of preparing for a long-term war almost seem like an impossibility. As the short-war theory gains credibility, there is less and less emphasis put on sustaining an industrial base that can produce and deliver war time products before stockpiles are used. Reserve stocks to support a short war will be long gone before the industrial base can respond to the needs of a long term conflict.

Even if the short-war theory is true, the United States may have difficulties supporting its forces. A special report in

January 1991 by Business Week during the Gulf War stated " . . . despite spending more than \$2 billion on war procurement, the military is still trying to make up shortfalls of supplies" ⁵ "Military planners gleaned one key lesson from the Persian Gulf: Wars of the future may break out with little warning. To ensure continuous readiness in an era of declining defense dollars and uncertain enemies, the Pentagon will place greater emphasis on intelligence, training, transportation, and 'surge planning' - the ability to gear up production lines quickly." ⁶ There is little doubt that an awareness exists of the need for a strong industrial base. The concern lies in developing a policy and a sustainment base that are as flexible as the needs of the military.

Today there seems to be an accepted precept that the current level of war reserves and production capabilities will be adequate to support the defense forces in a limited, short-term conflict. "In sum, the greatest risk of the short-war posture is that the war will not follow the planner's scenario and our forces will lack the staying power to avoid defeat" ⁷ Preservation of a flexible, responsive industrial base will be a key ingredient to this nation's success in any future conflict.

On August 2, 1990 President Bush gave a speech in Aspen Colorado where he identified one of his goals "to make America's arsenal smaller, smarter, swifter, and stronger." "To achieve that, the arms industry and the government will have to do business a lot differently." ⁸ Recognizing the future direction

and the responsibility to support the new direction "the United States must retain capabilities to support its national military strategy that go beyond normal peacetime research, development, and acquisition but also include the ability to surge for major contingencies and reconstitution to expand the force and sustain it in a major war." 9

With new developments in policy, budget, and world events occurring each day this paper can only be a "snapshot in time" of an ever-changing environment. But, is it enough to stir up discussion, generate opinion, and educate those who have a vested interest in preserving a most critical part of our military structure? Hopefully so!

The charts on the next page give the overall characteristics of the future U.S. forces and the desirable characteristics of the future industrial base. Extracted from an Office of Technology Assessment report, the charts serve as a point of reference in examining the challenges and alternatives the industrial base faces, as presented in this paper.

Characteristics

Characteristics of Future U.S. Forces

- * Smaller active and ready reserve forces
- * Less forward basing, greater strategic mobility
- * Continuing weapons performance advantage
- * Substantial nuclear capability
- * Chemical and biological defense capabilities
- * Greater dependence on mobilization

Desirable Characteristics of the Future Base

- * Advanced research and development capability
- * Ready access to civilian technology
- * Continuous design and prototyping capability
- * Limited, efficient peacetime engineering and production capabilities in key defense sectors
- * Responsive production of ammunition, spares, and consumables for theater conflict
- * Healthy, mobilizable civilian production capacity
- * Good, integrated management

Source: Office of Technological Assessment, 1991. ¹⁰

Challenges of Today's Industrial Base

Declining Budget. There is little doubt that the dollars allocated to defense in near-term budgets will decrease. "By Fiscal 1996, the defense budget will be down to 3.6% of GNP [gross national product], the lowest it's been since 1939." ¹¹ In his state of the Union address in January of this year, President Bush Called for "a \$50 billion scale-down in total defense spending during the next five years from the Pentagon's previous five-year plan." ¹²

More and more emphasis is being put on solving domestic issues that affect the day-to-day lives of millions of Americans. The Reagan era of abundant defense spending and acquisition of new, high technology weapons has reached its plateau and is waning as contracts of years gone by come to closure. As the decline of what was the Soviet Union, our major threat for many years, continues, few Americans see a need to retain our military structure in its current capacity. No threat, no need for military spending, so let's spend the money where it is needed most - on things like education, unemployment, drug enforcement, and health.

With pressure from the average person, Congress will have a difficult time justifying dollars for defense against a threat that is not easily seen. Because of this, the money available to buy defense equipment and supplies will be limited and tightly controlled, making procurement even more difficult than it is

today. "The Fiscal 1992 request for procurement is \$63.4 billion - a decline of 50% since Fiscal 1985 when measured in constant dollars" ¹³ With fewer contacts and more restrictions, the industries that support our military structure will look elsewhere to sell their goods and services. This rerouting of effort will have definite impacts on the availability of companies not only to produce the limited sustainment items our military needs for routine operation, but also to provide the capability to respond to a future national emergency or crisis.

Two areas that must be closely watched during budget cuts are maintenance of current equipment and in-process production of new items. The government tends to cut maintenance money and stretch out production runs to cut short term costs and dollar outlays. Cutting maintenance money will be even more critical as the military down sizes and relies on the capabilities of current equipment. If readiness is a true condition of a smaller force, then the equipment has to be adequately maintained and supported.

"Production stretch-outs invariably raise unit costs, thereby reducing even further the number of items that can be bought for a given sum." ¹⁴ This situation produces closer program scrutiny from all approving levels as the concern about cost and delivery is questioned at each budget cycle. The cost increases, the number of delivered items is reduced, and the customer has to wait for something he/she will get late, or not at all.

Decreased Threat. The Soviet Union, with all its military might and huge military complex, was for the last fifty years the major threat against which all military prowess was measured. Whatever we bought, made, or ever planned to introduce into our military complex was justified by comparing it to some threat the Soviet Union had looming over our heads. Whether it was some awesome nuclear capability, a mightier than Superman tank, a great hoard of thundering well-equipped soldiers, or an "I'll find you wherever you are" missile, we could always identify the threat.

We used this very real and very strong threat of the Soviet Union to convince the Congress and the people of the United States that we needed a very strong military to counter any potential attack. For many years it worked! Now, with the breakup of the Soviet Union into a smattering of independent states, the threat of yesteryear looks more like a confused, disorganized band of children rather than a swift and powerful giant. No longer are the people of this country convinced a threat still exists, particularly not with what is left of the Soviet Union.

The threats, as seen by the public, are not so much considered threats as they are "justifiable fights." They have a tendency to be conflicts of low intensity and of short duration. Often they are in support of human rights, to quell an injustice to a people or a nation, or to insure some economic sanctity that directly affects our way of life. They are "just causes" that we choose to support, rather than the defense of our nation that we

must insure.

Reduced Force Structure. Until just this past year our military focus has been on a large, powerful military structure deployed throughout the world. The idea was to have this large force forward deployed, with all its support structure, capable of defending a border, a country, or an ideology at a moment's notice. That idea is rapidly changing as the emphasis is now on the downsizing of our military strength and "bringing our boys home." Regional and low intensity conflicts are becoming the order of the day.

Nothing is gaining as much press and public notice as the cutbacks of the American military strength. Each day we see or hear of the downsizing of the military and the reaping of great "peace dividends." Dividends that are supposedly to be reinvested in the social programs of benefit to all peoples of this nation. If the military is to be smaller and able to fight smarter, perhaps some dividends should be invested in modern, high-tech equipment.

While it is true that the military will decrease in size from now until 1995(?), few plans are being made to determine the needs of the smaller military. While we have a tendency to look at the force structure only in terms of manpower, we must also make firm commitments to the equipment, maintenance, and support of the remaining force. Equipment will not last forever, nor will the spare parts and the knowledge used to repair and

maintain the equipment.

Even more, the suppliers of the spare parts are becoming fewer and farther between, increasing the probability of the smaller force becoming unready. Often the subcontractors or independent vendors under a prime contract produce only while the contract is in effect. While the onus is on the prime to deliver, there is little control over a subcontractor who no longer wants to play. Any way you slice it, spare parts are a vulnerable piece of the smaller military whose emphasis is on readiness and deployability.

Changing Priorities. Most of the people of the United States are looking beyond the military and are focusing on their immediate needs. The probability of any large-scale, long-term war seems a long way off. Many people have little interest in investing in a military structure that, in their opinion, has more than it needs to ward off any little annoyance that may occur. Why put more money in something we don't need? At least not now.

Among the top priorities of many Americans are the declining economic structure, the failing of the education system, the continuing war against drugs, and the unavailability of a health program. These things, right now, have more of a direct impact on people's daily lives than the probability of war. People want to forget war, ignore problems in other world nations, and start taking care of our own. The United States just helped win a war in the Gulf, so let's savor the victory and do "something" this

nation can directly benefit from, besides prepare for another war.

Image. "The defense industry of the U.S. is saddled with a serious negative image - an image it does not deserve but which it has done little to aggressively counteract." ¹⁵ When the government pays hundreds of dollars for hammers and toilet seats, it comes under great scrutiny and criticism by the American taxpayers. While the bulk of the blame comes to rest on the governmental procurement process and the people who operate it, some blame falls on the vendor(s) who have "ripped off" the government. Whether the cost can be explained or justified matters not. The excessive cost is so outrageous that no one wants to listen to a reason, they only want to blame someone. Tax dollars are being wasted and it has to stop!

With this prevailing image, we must deal with a public that is not sympathetic with the cause of the military structure. In many people's eyes the military is wrought with inefficient management of resources and excessive, useless buying. Too much is being wasted to support too few to do a job many think will seldom, if ever, have to be done. Increased pressure is being put on our Congress to direct monies away from defense spending and put it to use supporting social programs.

What is often forgotten, in the justification of the military, is - by definition, a military force, much like an insurance policy, is not an efficient use of funds. Its value is

in how effective it is when it is needed. ¹⁶

Procurement Policies. With all the bad press and improprieties that have surfaced in the acquisition arena, one has to wonder if the government ever purchases anything correctly, at a bargain price, and without bribing someone. If one were to look closely at the number of procurement actions the DoD handles each year, there is only a minute portion that is processed with questionable results. Still, the visibility of these few improprieties has forced the controlling factions to enact tighter and tighter controls over the acquisition process.

These controls, on both the government sector and the private firms, result in a tremendous burden in time, energies, and dollars. "These restrictive, complex and costly regulations and procedures discourage competitive commercial companies from doing business with the Pentagon, therefore limiting the military's access to commercial state-of-the-art technology." ¹⁷

Having so many controls has stopped many vendors from even bidding on contracts. "Existing regulations add between \$15-75 billion to the cost of doing business with the Pentagon . . ."

¹⁸ At the same time, these controls have put up many barriers for companies who want to, or use to want to, enter the defense contracting field. The loss of expertise on both sides of the fence has resulted in more problems than the controls have prevented.

One other real issue we must be aware of is the volume of

specifications required to support a contract action. The voluminous specifications the government is obliged to generate and the vendors are compelled to read, and follow, many times serve only to add confusion to an already confusing task. While it is necessary to provide documentation of needs, perhaps we should go more toward a performance specification rather than a physical description. We can tell the vendors what we need in a much shorter, clearer document than we can tell them how to build it.

Global Competition. Since the industrial revolution, the United States has been the leader in manufacturing and technology. Much of the technological advances came as a result of the development of weapons and support systems. The recent events of the Persian Gulf War showed that the United States still maintains the lead in technology with its awesome display of "smart" weapons. In the arena of "high-tech" weaponry there is little doubt the United States holds the lead.

What we must look at, however, are two different, yet competing scenarios. On one hand, we now have other nations of the world capable of developing and producing modern weapons and support systems. And, on the other hand, we have countries who are just beginning to emerge on the world scene and are more interested in acquiring conventional weapons than the newer, more sophisticated ones. Each case presents an area of competition for the United States' manufacturers who are attempting to sell

their products not only domestically but also to foreign nations.

In foreign competition we recognize the emergence of two dominant areas that will play heavily in future bidding. "Europe is moving quickly toward economic unification. The Pacific Rim nations are expanding economically and pose a serious challenge to the competitiveness of U.S. industries in the global electronics and armaments markets." ¹⁹ Not only are these two areas becoming competitive by their merits, but since 1988 "foreign concerns acquired more than 20 U.S. aerospace companies. They also acquired more than 100 U.S. computer corporations, 45 U.S. semi-conductor companies, and 35 U.S. advanced materials businesses." ²⁰

We must concern ourselves also with not only the idea of foreign vendors bidding for total contracts, but also the reliance this nation has on foreign materials (to include strategic and critical raw materials), component parts, and sub-assemblies. Even if the end item is controlled and assembled in the states, critical key elements of some of our most advanced weapon systems are provided by foreign companies. "Although insisting on domestic sources for U.S. defense systems may not always be prudent, the United States must maintain access to needed materials and production means." ²¹

These are the primary challenges that face the industrial

base as it is being forced to change and adapt to a new force structure with different requirements. Although there is no short and sweet solution to resolving the problems confronting the industrial base, the following section explores some alternatives to be considered. While none may furnish the ideal solution, they collectively may alleviate some hardships or at least provide some "breathing room" until a better solution can be found.

Alternatives to be Considered

Government Investment. For the many years that the commercial sector has worked hand-in-hand with the government in the research, development, test, and production of items for use by the military, the private sector has borne much of the expense of the initial development of items for potential government use. Companies have invested millions of dollars in research with the hopes of winning a contract and recouping their investment. Until recently this has been a "good bet" on the part of industry.

"After the gulf war, the Pentagon's plan was to save money through large reductions in manpower. The U.S. military edge would be continued by developing a new generation of high-tech weapons." ²² But now . . . with reduced force strength and a lessening world threat, the need for more or new weapons systems is on a serious decline. The trend is away from buying more weapons and as such, companies can no longer afford to invest in what may be a no-return venture. Because of no assurance on future buys, companies are shying away from research and are investing in products and improvements that will sell in the private sector and insure the company a profit. This trend is taking more and more of the industrial base that supports the military and is turning it into private sector production.

To prevent any more loss of production capability the government must be willing to invest some portion of its military

spending allowance into the research and development of new technologies. "[T]he Defense Dept. is looking to technology as a hedge against the uncertain threats of the future." ²³ However, the U.S. currently spends only about 0.2% of its total research and development budget on industrial development. ²⁴ While full scale production is out of the question, an increase in the amount this nation invests to support the development, and at least some testing, of new technologies is needed for two reasons. The first is to sustain a manufacturing capability to support production if and when the weapon systems are needed. The second is to make use of the continual improvements in technology developed by the private sector for other uses and to apply them to current military capabilities to maintain the weapon supremacy we as a nation now enjoy.

Become More Diversified. Too often companies have relied on a single product or family of products to provide the profit needed to continue in business. Particularly in the companies, their subsidiaries, and subcontractors that depend heavily upon government contracts the need to diversify was never a serious consideration. The government had become so reliable that there was no need to develop alternate products and markets. Today that "reliable market" has changed dramatically!

With the decrease in military budgets and the rapid decline in the number and size of contracts, many businesses will have to diversify - or die. "One way to accomplish this, . . . is to

move to flexible factories where assembly lines can be reconfigured to produce other products and a workforce with fewer narrow specialists and more generalists who have a wider range of skills." ²⁵

The concept of flexible/computer-integrated manufacturing, where computers can be programmed to perform different functions or control various processes, permits a company to vary its production line in a relatively short period. These systems permit the design of the product, the testing of the concept, and the control of the production process. ²⁶ Using automation for the primary steps of production allows for reduction in both cost and time while permitting the development of more new products. While it could not easily go from making tanks to toy trucks, it could be altered from tanks to heavy equipment.

The Catch-22 in this alternative is the requirement to update and modernize plant equipment. Without proper planning few companies can afford the expense, particularly when future work is dropping off and there is an uncertainty about new markets for new products. The gamble is between an almost sure death if nothing is done and the prospects of new products, new markets, and future profits.

One consideration, that overlaps between government investment and diversification, is the concept of shared manufacturing. Under this idea one party has, or invests in, the equipment and facilities and the other uses them under a fee-for-service agreement. Here the government may have, or invest in,

the resources needed to produce, modify or maintain a product line. Under contract the private sector would manage the process utilizing government facilities while paying, i.e. renting or leasing, the government for their use. Both sides win - the private sector because they do not have to provide the funding for facilities they do not have and may not need in the future. The government because it has an industrial facility to support a product(s) without the high cost of operation overhead.

Another option that sometimes seem to elude the private sector and is not usually considered by the government is the venturing of the private sector into non-traditional areas. That is into the maintenance, overhaul and repair of the items they manufactured in the first place. These functions are "normally" done by government facilities operated solely for sustainment after the buy. Considering that most of the repair parts are purchased from the company that made the end item, the company has the technical expertise, with little facility modification could probably change from new production to repair and overhaul. While this option may not rest well with the depots doing the missions today, in these austere times economics and good business sense should prevail.

Consolidate and Team. We often read in the newspapers or see on television that a major contract has been awarded to some, usually large, company. Seldom do we get to see how far and wide the affects of the award may be. Most major contracts have tens,

and often hundreds, of subcontractors. Most times the spoils of the award are shared among many as specialization plays an important role in the complex systems industries produce today. To keep the capabilities inhouse for all components and technologies would be an expense no vendor could bear.

Still, there seems to be teaming or cooperation only when there is a profit motive at hand. Companies tend to take on partners only when it is necessary through lack of a capability or the economies of subcontracting. What is being suggested here is a mutual sharing of everything from specifications to capabilities to prevent redundancy in the "inventing the same thing twice." This is almost heresy in the business community, but it makes good business sense.

It must be understood, at this point, that the teaming idea is not limited to only the private sector. Teaming may exist between government entities as well as between the public and private sectors. Some consolidation and teaming ideas are in support of, or a continuation of, the shared manufacturing idea addressed earlier. The emphasis is on economies of scale without distinct boundaries drawn by past habits or practices.

If companies, including the government, could share technology, processing techniques, and related resources, the price of the finished goods would drop substantially. The overhead associated with competition and duplication would be gone. The team concept offers the advantages of "pooled resources, reduced financial and technical risks, strengthened

competitive position, and optimized technical expertise." ²⁷

This sharing of knowledge would also help in the acquisition and bidding process as companies could bid as partners, sharing expenses, investments, and profits. It would also provide the government some assurance that there would be duplicity of production capability, delivery of product, and mobilization capability. The data base of collective information could also help answer a GAO concern of the government having "the ability to relate end item requirements to components, parts, and materials." ²⁸

Through this teaming effort, companies could network resources, parts, processes, technical specifications, design drawings, material requirements, delivery schedules, and other manufacturing related data. Business data rights can be protected while a data base is shared to house essential information to ensure technical competence for producers of government goods. Everyone would be smarter, the product better, and the price lower. "With defense budgets falling, manufacturers who do not participate in the few remaining programs will fail to retain market share and presence, and will fail to replace lost revenues, and will be unable to maintain technological excellence for future success." ²⁹

Improve Efficiency. In comments on increasing efficiency, Robert J. Whalen, head of Martin Marietta's advanced-technology research said, "Doing the same things now at half the price is as

important as getting the next jump in technology." ³⁰ Production efficiency may be the key factor between a company shutting its doors or remaining competitive and making a profit. In dealing with the industrial base capabilities we must look at the techniques and capabilities of the manufactures to produce a product in an efficient economic manner. Efficiency and increased productivity most assuredly can be achieved through redefining the processes and eliminating overhead.

"The shift to highly automated and integrated enterprises or paperless factories now taking shape in the U.S. defense industries could boost productivity 30-50% within five to 10 years." ³¹ The difference in the prices of products often lies in the technology used to first design and then produce them. "Let me tell you," said Lockheed's Chairman Daniel M. Tellep, "it's a hell of a lot easier to get a 30 percent reduction in cost by better design than to get a 10 percent cost reduction in manufacturing cost." ³²

Heavy overhead may take the cost to a point where it is not economically feasible to produce or the price will be too high for anyone to purchase them. The layers of management between the production worker and top management varies from five to seven in both the private and public sectors. ³³ Along this same line is the requirement on the government side, and applying to those companies doing government business, is the number of people required by regulation, i.e. inspectors, quality control, that must be a part of the production process. It almost seems

obvious that there are too many people, costing too much money that no one is doing much about.

One of the ways to reduce cost is to apply the concepts and practices of Total Quality Management (TQM). Utilizing a new philosophy to manage and improve each step of a process, to make it better therefore more efficient and cost effective, is quickly catching on in industry. When Martin Marietta "brought its designers around a table with production workers, supervisors and production engineers, they were able to redesign both the structure and the production process" to reduce the production time from 2,500 hours to 800 hours - a savings of \$85,000 on each Titan rocket. ³⁴

One other area that applies to both the private and the organic sectors is the excess capacity that is available but not being utilized. This is capacity that ranges from maintaining "warm production bases," to under-utilized production facilities, to unused warehouses and storage facilities. We pay to have these facilities "just in case," when we need to jointly make some hard business decisions on what is actually required. "We need the overcapacity to go away permanently if we are ever to become truly cost-efficient." ³⁵

Still, not all the effort for increased efficiency can be required of industry. There are things the government can do to alleviate, or at least lessen, the burden on defense industries. The government could save a tremendous amount of money and time if it would "decide on requirements and stick to them." ³⁶ Every

time the specification changes, the contract has to be modified, the cost increases, and the delivery schedule slips.

Another area of help would be to decrease the number of regulations, policies, review processes, etc. that each contract action must pass through from concept to delivery. The establishment of the Acquisition Corps has streamlined the review and approval process by limiting the levels of command and review. But the number and complexity of regulations governing the "do's and don't's" of acquisition is nothing short of a project manager's nightmare. The commercial sector has just as many, if not more, rules and regulations it must follow and abide by to bid on, produce, and deliver items the government asks for.

Increase Commercialization. "A recent Center for Strategic & International Studies report by a panel of U.S. lawmakers, contractors and former military officials endorsed the concept of greater integration between the civil and military sectors as a way of reducing costs and maintaining a viable industrial base. The 18-month-long effort concluded that the artificial separation of commercial and military research and development was a key factor in the erosion of the defense industrial base." ³⁷

Many items the military buys are unique and used only by the armed forces. While there is a strong argument that many of these items must meet military specifications for war time use, "It may also be possible to reduce unneeded military specifications to make greater use of items that can be created

by the commercial production base." ³⁸ When it comes to tanks or smart weapons, no one but the military has a need for them. However, when evaluating boots, meals, blankets, and other consumable goods the items available on the commercial market often meet or exceed military requirements.

When requirements are established for items for use by our military we must learn to sort out the differences between what is needed and what is wanted. Too often we have bought goods and services that far exceed what is needed and have paid the price twice - once in real dollars and once in public embarrassment. We must learn to buy smart by determining real requirements, exploring what is available commercially, and buying only what is needed, when it is needed.

Buying commercially has several advantages. First, because no special production process has to be set up there is no added expense for equipment or facilities. Second, the processes are already in place the time between order and delivery is much shorter. Next, if an item is available in the commercial market, most likely there is more than one source. Multiple sources almost guarantee a lower price because of competition while assuring alternate suppliers if the primary cannot delivery. And last, because of availability there is little need to warehouse more than a short-term sustainment quantity thus reducing storage and handling costs.

Promote Foreign Military Sales (FMS). One way to sell more

products and services is to expand the market. This is definitely an option that should be considered as a way to keep manufacturers in business. By selling products abroad, i.e. those items we use in our defense systems, industry can continue to produce the items, improve the items, make a profit, and maintain production capability (the main emphasis of this effort).

"Some experts are pushing for allied governments to examine the merits of transatlantic defense cooperation. Advocates argue that such efforts could help spread development costs and provide economies of scale in production." ³⁹ We must pursue this option with some caution. Making the weapon systems, component parts, and spares available to foreign nations takes on a degree of sensitivity. The purchasing nation then has the potential to match the United States in armaments - if not in numbers, at least in technology and capability. When the countries are staunch allies and probable partners in a coalition effort, there are many advantages in having compatible equipment and spares on all parts of the battlefield. When the equipment ends up on the opposing side, the technological edge we now have may lose some of its sharpness.

Here is another area the government can help industry to compete internationally. Realizing there is a sensitive balance between protecting U.S. industry from less expensive foreign imports, and supporting U.S. industry's ability to compete abroad, perhaps our government should look into reducing trade

restrictions with other nations throughout the world. ⁴⁰ Not only would this better relations with some of our trading partners and foreign suppliers, but it also would help to support a segment of the industrial base that might otherwise disappear.

While there are other alternatives that could be explored, the attempt was made to look at those that would offer the most benefit with the least amount of turmoil. Some offer technical solutions. Others indicate a needed change in the way we think and do business. "Business as usual" will no longer play in the changing environment confronting us.

Summary

Conclusions.

Shifting the current domestic industrial base from large-scale production of military-related systems will take time. By the end of fiscal 1997, estimates are it would take two to four years to restore production capability to 1990 levels for items whose lines have gone "cold." Outdated facilities, fewer prime contractors and subsystem suppliers, increased foreign sourcing, reeducation of a production work force, and manufacturing equipment lead times will combine to reduce the capability of industry to convert rapidly to military production and expand to emergency operating capacity. ⁴¹

In today's world of lessening threats, it may be difficult to convince the Congress and the people of the United States that any major threat really exists. Therefore, determining the "right" level to maintain an adequate industrial base will continually be an issue for debate. What is not debatable is the fact that a responsive industrial base must be available when needed. The question of "Why do we need to spend money on something we probably will not need?" will often be asked. The question of more concern might be "What price do we pay if we don't prepare?"

Recommendations.

* That the government continue to invest in Research and Development programs to maintain the technological lead through exploration of new capabilities and improvement of current capabilities.

* That the government join with industry in evaluating the benefits of sharing technologies under the umbrella of the shared manufacturing concept.

* That the government foster the private sector to venture into the areas of maintenance, overhaul and repair.

* That the government and industry explore the possibilities of teaming, government with government, government with industry, and industry with industry.

* That government and industry be encouraged to improve efficiency by adopting new techniques, i.e. TQM; evaluating new technologies, i.e. flexible manufacturing; and reducing layers of management.

* That the concept of "warm production bases" be seriously evaluated in all aspects when determining the need, the costs, and the benefits.

- * That the government maintain organic capabilities for -
- essential repair,
 - component part fabrication,
 - servicing equipment that is unique and obsolete
by industry standards, and
 - providing long lead time items.

* That the government allow industry to use more commercial components and practices.

- * That the government reevaluate critical equipment by -
- identifying,
 - revalidating the requirements,
 - consolidating, where applicable, and
 - eliminating, when practical.

* That the government, through the Acquisition Corps, continue to train both military and civilian personnel in the acquisition arena to better procurement practices and associations with industry.

A Final Thought

Our success in Operation Desert Storm was not an accident. It was the result of the courage of our troops, the skill of our commanders and the first-rate systems that you [the contractors] helped to develop and produce. We must not - we will not - lose you through neglect. ⁴²

From remarks by Eleanor Spector
Director of Defense Procurement

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